AMENDMENTS TO THE CLAIMS

1. (Currently Amended) An electrical power distribution center comprising:

a gateway module including logic to interface to a vehicle management computer (VMC) via a dual redundant data bus, wherein the gateway module comprises redundant microcontrollers operably connected to the VMC for selectively controlling supply of electrical power to a plurality of separate electrical loads;

two internal serial data buses, wherein the two internal serial data buses are of two different types and the redundant microcontrollers are each operably connected to the two internal serial data buses; and

a plurality of Load Management Modules (LMMs), each Load Management Module operably connected to the internal serial data buses for receiving control commands from the gateway module, wherein each Load Management Module comprises:

a local microcontroller;

a plurality of power switching devices; and

a plurality of ~~application-specific integrated circuits (ASICs)~~ switch controllers corresponding to the plurality of power switching devices for interfacing the power switching devices to the local microcontroller, wherein each of said

switch controllers performs RMS value processing and I^2t value calculation.

2. (Currently Amended) The electrical power distribution center according to claim 1, wherein each switch controller ~~ASIC~~ provides logic for internal reset and calibration sequences during a power-up initiation cycle.

3. (Currently Amended) The electrical power distribution center according to claim 1, wherein each switch controller ~~ASIC~~ is configurable for both AC and DC loads at a plurality of current ratings.

4. (Currently Amended) The electrical power distribution center according to claim 1, wherein each switch controller ~~ASIC~~ includes an analog signal processing block that conditions a load current sense voltage across a sense resistor to produce a true RMS current value.

5. (Currently Amended) The electrical power distribution center according to claim 4, wherein, each switch controller uses the true RMS current value ~~is used~~ for calculating an I^2t value.

6. (Currently Amended) The electrical power distribution center according to claim 5, wherein each switch controller ~~ASIC~~ includes an analog processor that uses the I^2t value to control variable trip times under different application configurations.

7. (Currently Amended) The electrical power distribution center according to claim 1, wherein each switch controller ~~ASIC~~ includes a thermal shut-down circuit that opens the corresponding power switching device when a substrate of the power switching device exceeds a predetermined reference temperature.

8. (Original) The electrical power distribution center according to claim 7, wherein the predetermined reference temperature is adjusted using an external setting resistor.

9. (Currently Amended) The electrical power distribution center according to claim 1, wherein each switch controller ~~ASIC~~ includes logic for zero-crossing current detection and zero-crossing voltage detection.

10. (Original) The electrical power distribution center according to claim 9, wherein the zero-crossing current detection and zero-crossing voltage detection are used for controlling off/on

activation timing of the corresponding power switching device when operating in an AC mode.

11. (Currently Amended) The electrical power distribution center according to claim 1, wherein each switch controller ~~ASIC~~ includes logic for performing at least one of a current detection and conditioning, absolute current value detection, true RMS conversion, I^2t precision multiplier and integrator, fast shutdown signal processing, load status indicator, fail-safe AC shut-down, thermal shut-down signal processing, zero-crossing current detection, opto-isolated input/output signal conditioning and zero-crossing voltage signal conditioning.

12. (Currently Amended) The electrical power distribution center according to claim 1, wherein each switch controller ~~ASIC~~ includes logic for a soft-start function when operating in a DC mode.

13. (Currently Amended) The electrical power distribution center according to claim 1, wherein at least two of the plurality of switch controllers ~~ASICs~~ are coordinated to allow ganged operation.

14. (Currently Amended) The electrical power distribution center according to claim 13, wherein three switch controllers ~~ASICs~~ and power switching devices are gang operated in an AC mode to control a three-phase power source.

15. (Original) The electrical power distribution center according to claim 1, further comprising at least one relay LMM having a plurality of relay devices.

16. (Original) The electrical power distribution system according to claim 1, wherein the two serial data buses are Synchronous Serial Peripheral Interface (SPI) and Asynchronous Serial Communications Interface (SCI), respectively.

17. (Original) The electrical power distribution system according to claim 1, wherein each power switching device comprises a fusible link to cause an open circuit in case of a short circuit failure of the power switching device.

18. (Original) The electrical power distribution system according to claim 17, wherein the fusible link is a MOSFET wirebond.

19. (Original) The electrical power distribution system according to claim 1, wherein each power switching device comprises:

a thermal sensor;

a sense resistor; and

a plurality of MOSFETs.

20. (Original) The electrical power distribution system according to claim 19, wherein each MOSFET includes a fusible link to cause an open circuit in case of a short circuit failure of the power switching device, wherein the fusible link is a MOSFET wirebond.

21. (New) The electrical power distribution center according to claim 1, wherein said switch controllers are implemented as application specific integrated circuits.